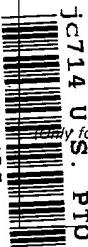


**UTILITY
PATENT APPLICATION
TRANSMITTAL**

Only for new nonprovisional applications under 37 C.F.R. 1.53(b)(1)



Attorney Docket No.		0402/00602
First Named Inventor or Application Identifier		Toru Nakada et al.
Title	PROGRAM GUIDE INFORMATION PRODUCING APPARATUS AND RELATED PROGRAM GUIDE INFORMATION COLLECTING/TRANSMITTING SYSTEM	
Express Mail Label No.		

APPLICATION ELEMENTS

1. Filing fee as calculated below.
2. Specification [Total Pages **[34]**]
(preferred arrangement set forth below)
 - Descriptive title of the invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the Invention
 - Brief Summary of the invention
 - Brief Description of the Drawings *(if filed)*
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. Drawing(s) *(35 USC 113)* [Total Pages **[12]**]
4. Oath or Declaration [Total Pages **[2]**]
 - a. Newly executed (original or copy)
 - b. Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
- DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b)
5. Incorporation By Reference *(useable if Box 4b is checked)* The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. Microfiche Computer Program *(Appendix)*
7. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
 - a. Computer readable copy
 - b. Paper Copy *(identical to computer copy)*
 - c. Statement Verifying identity of above copies
8. Assignment papers (cover sheet & document(s))
9. 37 CFR 3.73(b) Statement Power of Attorney
10. English Translation Document *(if applicable)*
11. Information Disclosure Copies of IDS Statement (IDS)/PTO-1449 Citations
12. Preliminary Amendment
13. Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
14. Small Entity Statement filed in prior application, Statement(s) Status still proper and desired
15. Certified copy of Priority Document(s)
(if foreign priority is claimed)
14. Other:

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

Continuation Divisional Continuation-in-part (CIP) of prior application No. _____

18. CORRESPONDENCE ADDRESS

<input type="checkbox"/> Customer Number or Bar Code Label	<i>(Insert Customer No. or Attach bar code label here)</i>		or <input type="checkbox"/> correspondence address below		
NAME	Pollock, Vande Sande & Amernick, R.L.L.P. Suite 800				
ADDRESS	1990 M Street, N.W.				
CITY	Washington	STATE	DC	ZIP CODE	20036-3425
COUNTRY	U.S.A	TELEPHONE	(202) 331-7111	FAX	(202) 293-6229

1C678 U.S. PRO
09/512306
02/24/00

PROGRAM GUIDE INFORMATION PRODUCING APPARATUS AND RELATED PROGRAM GUIDE INFORMATION COLLECTING/TRANSMITTING SYSTEM

5

BACKGROUND OF THE INVENTION

The present invention relates to a broadcast system providing broadcast services in which program guide information is multiplexed with audio/video data. More specifically, the present invention relates to a program guide information collecting/transmitting system which transmits program guide information of each broadcaster to other broadcaster. Furthermore, the present invention relates to a program guide information producing apparatus of each broadcaster which produces the program guide information. Especially, the present invention assures reliable broadcasting of program guide information in each broadcaster even when the transmission of program guide information is failed.

A conventional television schedule information transmission and utilization system and process is disclosed in the United States Patent No. 5,790,198 or in the United States Patent No. 5,619,274.

In general, the digital broadcasting uses the MPEG2 technique to transmit audio/video signals. The MPEG2 technique is used for packet multiplexing a plurality of audio/video signals into a single transport stream (TS) which is aired. In this case, the transport stream (TS) includes program guide information in addition to audio/video data. More specifically, the program guide information is constituted by the PSI (Program Specific Information) for selecting the MPEG2 regulated programs and supplementary information (SI) required in constituting a program guide table (EPG) which is regulated by the ARIB (Association of Radio Industries and Business: which is an association for standardizing the domestic broadcasting system). The program guide table (EPG) is described in a sectional format table.

30

SUMMARY OF THE INVENTION

An object of the present invention is to a program guide information producing apparatus which is not adversely influenced by the troubles caused in the program guide information collecting/transmitting apparatus or the like, thereby assuring reliable transmission of common program guide information in each broadcaster. Furthermore, another object of the present invention is to provide a program guide information producing apparatus which is capable of quickly renewing the common program guide information in response to the sudden change of the broadcasting schedule. Moreover, another object to of the present invention is to provide a program guide information collecting/transmitting system incorporating the above-described program guide information producing apparatus.

The present invention constitutes a program guide information collecting/transmitting system in the following manner. Each broadcaster has a program guide information producing apparatus which generates self-produced common program guide information. The self-produced common program guide information is transmitted to a program guide information collecting/transmitting apparatus. The received self-produced common program guide information is transmitted from the program guide information collecting/transmitting apparatus to other broadcasters. Thus, each of other broadcasters receives the transmitted self-produced common program guide information produced by a different broadcaster.

The program guide information producing apparatus unites or combines the self-produced common program guide information produced by itself with other broadcaster's common program guide information received from the program guide information collecting/transmitting apparatus. The united common program guide information is output as all broadcasters' common program guide information.

Accordingly, it becomes possible to surely output the self-produced common program guide information even when the program guide information collecting/transmitting apparatus is in trouble.

Furthermore, the program guide information producing apparatus comprises a common program guide information storing section which stores the common program guide information corresponding to a designated date/time when the common program guide information is received from the program guide information collecting/transmitting apparatus. Furthermore, the program guide information producing apparatus comprises a version number adding section which adds a version number to common program guide information received from the program guide information collecting/transmitting apparatus. Accordingly, even when the program guide information collecting/transmitting apparatus is in trouble, it becomes possible to continuously output the common program guide information during the designated duration or to eliminate the version jump.

Furthermore, the program guide information producing apparatus comprises a self-produced information stepwise transmitting section which transmits control information prior to other information when renewed self-produced information is sent to the program guide information collecting/transmitting apparatus. The control information is used for audio/video tape recording preservation or the like in a broadcast receiver.

Accordingly, in each broadcast receiver, the audio/video tape recording reservation function can work properly even when the program guide information is suddenly changed.

According to a preferred embodiment, the present invention provides a program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, in which the program guide information producing apparatus comprises a common program guide information producing section which generates self-produced common program guide information. With this arrangement, it becomes possible to output the self-produced common program guide information even when the program guide information collecting/transmitting apparatus is in trouble.

According to a preferred embodiment, the present invention further

provides a program guide information output section which unites the self-produced common program guide information with other broadcaster's common program guide information, and outputs the united common program guide information. With this arrangement, it becomes possible to unite the self-produced common program guide information with other broadcaster's common program guide information. Thus, it becomes possible to output the united common program guide information as all broadcasters' common program guide information. In this case, it is possible to continuously maintain the "Continuity Counter" which serves as an index of TS continuity.

According to a preferred embodiment, the present invention provides a program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, in which the program guide information producing apparatus comprises a common program guide information storing section which stores the common program guide information corresponding to a designated time duration in advance, the common program guide information being received from a program guide information collecting/transmitting apparatus or other broadcaster. With this arrangement, it becomes possible to continuously output the common program guide information during the designated duration even when any other broadcaster or the program guide information collecting/transmitting apparatus is in trouble.

According to a preferred embodiment, the present invention further provides a common program guide information storing section which stores the other broadcaster's common program guide information corresponding to a designated time duration in advance. With this arrangement, it becomes possible to output the other broadcaster's common program guide information during the designated duration even when any other broadcaster or the program guide information collecting/transmitting apparatus is in trouble.

According to a preferred embodiment, the present invention provides a program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information,

in which the program guide information producing apparatus comprises a self-produced information transmitting section which transmits only the information relating to broadcast time (length, time slot) of programs to a program guide information collecting/transmitting apparatus. With this arrangement, it becomes
5 possible to promptly transmit the changed broadcast time of the program to each broadcast receiver in case of sudden change of the program guide information.

According to a preferred embodiment, the present invention provides a program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information,
10 in which the program guide information producing apparatus comprises a version number adding section which adds a version number to common program guide information received from a program guide information collecting/transmitting apparatus or other broadcaster. With this arrangement, it becomes possible to eliminate the version jump even when the acquirement of the common program guide information is failed due to the trouble caused in the network connecting the program guide information producing apparatus and the program guide information collecting/transmitting apparatus.

According to a preferred embodiment, the present invention further provides a version number adding section which adds a version number to the self-produced common program guide information produced by its own broadcaster and also to the other broadcaster's common program guide information received from the program guide information collecting/transmitting apparatus or other broadcaster. With this arrangement, it becomes possible to eliminate the version jump even when the acquirement of the other broadcaster's
20 common program guide information is failed due to the trouble caused in the network connecting the program guide information producing apparatus and the program guide information collecting/transmitting apparatus.

According to a preferred embodiment, the present invention provides a program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information,
25 in which the program guide information producing apparatus comprises a self-

produced information stepwise transmitting section which transmits control information prior to other information when renewed self-produced information is sent to a program guide information collecting/transmitting apparatus. In this case, the control information is used for audio/video tape recording preservation or the like in a broadcast receiver. With this arrangement, in each broadcast receiver, the audio/video tape recording reservation function can work properly even when the program guide information is suddenly changed.

According to a preferred embodiment, the present invention further provides a self-produced information stepwise transmitting section which transmits control information prior to other information when renewed self-produced information is sent to a program guide information collecting/transmitting apparatus. The control information is used for audio/video tape recording preservation or the like in a broadcast receiver. With this arrangement, in each broadcast receiver, the audio/video tape recording reservation function can work properly even when the program guide information is suddenly changed.

According to a preferred embodiment, the present invention causes the self-produced information stepwise transmitting section to transmit only the control information relating to a presently broadcasted program to the program guide information collecting/transmitting apparatus prior to others among the control information relating to the audio/video tape recording preservation or the like in the broadcast receiver. Thus, it becomes possible to transmit only the control information relating to the presently broadcasted program prior to other control information. In other words, it becomes possible to promptly transmit the high-priority program guide information to each broadcast receiver at an earlier timing.

According to a preferred embodiment, the present invention provides a program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, in which the program guide information producing apparatus comprises a self-produced information checking section which obtains and checks self-produced

information stored in a program guide information collecting/transmitting apparatus after the self-produced information is transmitted to the program guide information collecting/transmitting apparatus. With this arrangement, it becomes possible to check whether or not the information has been accurately transmitted from the program guide information producing apparatus to the program guide information collecting/transmitting apparatus. Furthermore, it becomes possible to check whether or not the transmitted information has been modified or tampered by someone else.

According to a preferred embodiment, the present invention further provides a self-produced information checking section which obtains and checks the self-produced common program guide information stored in a program guide information collecting/transmitting apparatus after the self-produced common program guide information is transmitted to the program guide information collecting/transmitting apparatus. With this arrangement, it becomes possible to check whether or not the information has been accurately transmitted from the program guide information producing apparatus to the program guide information collecting/transmitting apparatus. Furthermore, it becomes possible to check whether or not the transmitted information has been modified or tampered by someone else.

According to a preferred embodiment, the present invention provides a program guide information collecting/transmitting system including a program guide information collecting/transmitting apparatus for transmitting program guide information to other broadcasters, wherein each broadcaster generates self-produced common program guide information and transmits the self-produced common program guide information to the program guide information collecting/transmitting apparatus. The program guide information collecting/transmitting apparatus transmits the received self-produced common program guide information of each broadcaster to other broadcasters. And, the other broadcasters receive the transmitted self-produced common program guide information of each broadcaster as common program guide information produced by a different broadcaster. With this embodiment, each broadcaster can unite or

combine the self-produced common program guide information produced by itself with other broadcaster's common program guide information received from the program guide information collecting/transmitting apparatus. The united common program guide information is output as all broadcasters' common program guide information.

According to a preferred embodiment, the present invention provides a common program guide information storing section in the program guide information collecting/transmitting apparatus. The common program guide information storing section administers the self-produced common program guide information transmitted from each broadcaster. With this arrangement, the program guide information collecting/transmitting apparatus can receive the common program guide information produced by each broadcaster and can administrate the all broadcasters' common program guide information.

According to a preferred embodiment, the present invention further improves the program guide information collecting/transmitting system. More specifically, each broadcaster transmits the self-produced common program guide information corresponding to a designated time duration to the program guide information collecting/transmitting apparatus. Then, the program guide information collecting/transmitting apparatus causes the common program guide information storing section to store the received self-produced common program guide information transmitted from each broadcaster during the designated time duration. With this arrangement, it becomes possible to continuously output the other broadcaster's common program guide information at least during the designated duration even when any other broadcaster is in trouble.

According to a preferred embodiment, the present invention provides a program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, in which the program guide information producing apparatus comprises an inter-station self-produced information transmitting section which directly transmits self-produced information to other broadcaster, and an inter-station common program guide information receiving section which directly receives common

program guide information from other broadcasters. With this arrangement, it becomes possible to omit the program guide information collecting/transmitting apparatus. This makes it possible to reduce the operational cost such as the operator expenses required in using the program guide information collecting/transmitting apparatus.

According to a preferred embodiment, the present invention further provides an inter-station self-produced information transmitting section which directly transmits the self-produced common program guide information, and an inter-station common program guide information receiving section which directly receives the other broadcaster's common program guide information from the other broadcaster. With this arrangement, it becomes possible to omit the program guide information collecting/transmitting apparatus. This makes it possible to reduce the operational cost.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description which is to be read in conjunction with the accompanying drawings, in which:

Fig. 1 is a block diagram schematically showing the arrangement of a program guide information producing apparatus in accordance with a first embodiment of the present invention;

Fig. 2 is a block diagram schematically showing the arrangement of a program guide information collecting/transmitting system in accordance with the first embodiment of the present invention;

Fig. 3 is a block diagram schematically showing the arrangement of a program guide information producing apparatus in accordance with a second embodiment of the present invention;

Fig. 4 is a block diagram schematically showing the arrangement of another program guide information producing apparatus in accordance with the second embodiment of the present invention;

Fig. 5 is a view explaining program guide information stored in a common

program guide information storing section of the program guide information producing apparatus in accordance with the second embodiment of the present invention;

5 Fig. 6 is a block diagram schematically showing the arrangement of a program guide information collecting/transmitting apparatus in accordance with the second embodiment of the present invention;

Fig. 7 is a block diagram schematically showing the arrangement of a program guide information producing apparatus in accordance with a third embodiment of the present invention;

10 Fig. 8 is a block diagram schematically showing the arrangement of another program guide information producing apparatus in accordance with the third embodiment of the present invention;

Fig. 9 is a view explaining version numbers assigned by a version number adding section of the program guide information producing apparatus in accordance with the third embodiment of the present invention;

Fig. 10 is a view explaining the transmission order of program guide information in the program guide information collecting/transmitting system in accordance with a fourth embodiment of the present invention;

20 Fig. 11 is a block diagram schematically showing the arrangement of a program guide information producing apparatus in accordance with the fourth embodiment of the present invention;

Fig. 12 is a block diagram schematically showing the arrangement of another program guide information producing apparatus in accordance with the fourth embodiment of the present invention;

25 Fig. 13 is a view explaining another transmission order of program guide information in the program guide information collecting/transmitting system in accordance with the fourth embodiment of the present invention;

Fig. 14 is a block diagram schematically showing the arrangement of a program guide information producing apparatus in accordance with a fifth embodiment of the present invention;

30 Fig. 15 is a block diagram schematically showing the arrangement of

another program guide information producing apparatus in accordance with the fifth embodiment of the present invention;

Fig. 16 is a block diagram schematically showing the arrangement of a program guide information collecting/transmitting system in accordance with a sixth embodiment of the present invention;

Fig. 17 is a block diagram schematically showing the arrangement of a program guide information producing apparatus in accordance with the sixth embodiment of the present invention;

Fig. 18 is a block diagram schematically showing the arrangement of an original program guide information collecting/transmitting system;

Fig. 19 is a view showing the classification of program guide information; and

Fig. 20 is a block diagram schematically showing the arrangement of an original program guide information producing apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Digital Broadcasting System

Fig. 18 shows an original digital broadcasting system to which the present invention is applied. This digital broadcasting system comprises a plurality of broadcasting center systems (i.e., broadcasters "A" to "N"), a program guide information collecting/transmitting apparatus 101 which produces common program guide information based on program organizing information of each broadcaster, an uplink apparatus 106 which receives the audio/video information and the program guide information from each broadcaster and transmits radio waves carrying both the audio/video information and the program guide information, and each broadcast receiver 107 which receives the transmitted information.

Each broadcasting center system comprises an audio/video and program guide information organizing apparatus 103 which organizes the audio/video data and program guide information, an audio/video stream producing apparatus 104 which produces a stream of audio/video data, a program guide information

5

producing apparatus 102 which receives the program organizing information from the audio/video and program guide information organizing apparatus 103 and outputs program guide information, and a TS multiplexing apparatus 105 which multiplexes the transport stream (TS) of audio/video data with the program guide information.

10

In each broadcaster, the audio/video and program guide information organizing apparatus 103 organizes the audio/video data of programs and the program guide information. The audio/video stream producing apparatus 104 is synchronous with the audio/video and program guide information organizing apparatus 103 to send the audio/video data to the TS multiplexing apparatus 105.

20

The program guide information producing apparatus 102 receives the program organizing information (i.e., original data for the program guide information) from the audio/video and program guide information organizing apparatus 103. Based on the received program organizing information, the program guide information producing apparatus 102 generates program guide information which includes the program specific information (PSI) required in selecting the audio/video data and the supplementary information (SI) required in constituting a program guide table.

25

The TS multiplexing apparatus 105 multiplexes the program guide information with the audio/video data and transmits the multiplexed TS to the uplink apparatus 106. When the digital broadcasting system includes a plurality of broadcast providers, the uplink apparatus 106 transmits radio waves carrying both the audio/video data and the program guide information received from all broadcasters. The broadcast receiver 107 receives the audio/video data and the program guide information transmitted from the uplink apparatus 106.

30

In this digital broadcasting system, to display the program guide table covering all broadcasters by using a single TS without forcing the broadcast receiver 107 to switch the TS (i.e., without changing the tuning), it is necessary that the TS transmitted from one broadcaster, e.g., broadcaster “A”, needs to include the program guide information of other broadcasters. The program guide

information commonly involved in TSs of all broadcasters is referred to as common program guide information. Meanwhile, the program guide information individually transmitted in its own TS from each broadcaster, for example during the spare time between programs, is referred to as individual program guide information. The program guide information producing apparatus 102 cannot produce the common program guide information covering all of the broadcasters based on only the self-produced program organizing information received from the audio/video and program guide information organizing apparatus 103.

The common program guide information can be classified into self-produced common program guide information and other broadcaster's common program guide information. Fig. 19 shows the common program guide information classified into self-produced program guide information and other broadcaster's common program guide information. The self-produced common program guide information describes the common program guide information relating to self-produced program contents. The other broadcaster's common program guide information describes the common program guide information relating to other broadcaster's program contents.

The program guide information collecting/transmitting apparatus 101 receives the program organizing information from the program guide information producing apparatus 102 of each broadcasting center system, produces the common program guide information covering all of the broadcasters, and returns the produced common program guide information to the program guide information producing apparatus 102 of each broadcasting center system.

As shown in Fig. 20, the program guide information producing apparatus 102 of each broadcasting center system comprises a self-produced information transmitting section 201 which transmits the self-produced program organizing information to the program guide information collecting/transmitting apparatus 101, a common program guide information receiving section 202 which receives the common program guide information covering all of the broadcasters (i.e., all broadcasters' common program guide information), and a program guide information output section 203 which transmits the common program guide

information to the TS multiplexing apparatus 105.

The self-produced information transmitting section 201 receives the program organizing information from the audio/video and program guide information organizing apparatus 103 and transmits the received program organizing information to the program guide information collecting/transmitting apparatus 101. The common program guide information receiving section 202 receives the all broadcasters' common program guide information covering all of the broadcasters from the program guide information collecting/transmitting apparatus 101, and sends the received all broadcasters' common program guide information to the program guide information output section 203. The program guide information output section 203 transmits the received all broadcasters' common program guide information to the TS multiplexing apparatus 105. This arrangement makes it possible to display a program guide table (EPG) covering all of the broadcasters in each broadcast receiver 107 receiving the TS transmitted from a specific broadcaster (e.g., broadcaster "A"), without requiring the broadcast receiver 107 to switch the TS.

However, according to the digital broadcasting program guide information collecting/transmitting system shown in Fig. 18, a problem arises when the program guide information collecting/transmitting apparatus 101 is in trouble or when the network connecting each broadcasting center system to the program guide information collecting/transmitting apparatus 101 is in trouble. In such cases, each broadcaster cannot renew the common program guide information. If the trouble lasts long (e.g., when the effective broadcast time of the presently aired common program guide information expires), each broadcaster will be unable to output the common program guide information itself.

Furthermore, each broadcaster receives the all broadcasters' common program guide information covering all of the broadcasters after the program organizing information is once transmitted to the program guide information collecting/transmitting apparatus 101. Accordingly, another problem arises when the broadcasting schedule is suddenly changed due to extension of a sports event program or interruption by urgent or emergency news. In such cases, it is

difficult to quickly renew the common program guide information in response to the sudden change of the broadcasting schedule. This will cause problems in each broadcast receiver 107, for example in the tuning operation and in the audio/video tape recording reservation or the like.

5 *Preferred Embodiments of Present Invention*

Hereinafter, preferred embodiments of the present invention will be explained with reference to Figs. 1 to 17. Identical parts are denoted by the same reference numerals throughout the views.

10 *First Embodiment*

A first embodiment of the present invention provides a program guide information collecting/transmitting system in which each broadcaster generates self-produced common program guide information.

15 Fig. 2 shows a schematic arrangement of the program guide information collecting/transmitting system in accordance with the first embodiment of the present invention. The system shown in Fig. 2 differs from the original system (Fig. 18) in that the program guide information collecting/transmitting apparatus 101 receives the self-produced common program guide information from the program guide information producing apparatus 102 of each broadcasting center system. And, the program guide information collecting/transmitting apparatus 101 transmits other broadcaster's common program guide information to the program guide information producing apparatus 102 in each broadcasting center.

20 Fig. 1 shows a schematic arrangement of the program guide information producing apparatus 102. The program guide information producing apparatus 102 comprises a common program guide information producing section 204 which receives the program organizing information from an audio/video and program guide information organizing apparatus 103. The common program guide information producing section 204 generates self-produced common program guide information based on the received program organizing information. The self-produced common program guide information is sent from the common program guide information producing section 204 to a self-produced

information transmitting section 201. The self-produced information transmitting section 201 transmits the self-produced common program guide information to the program guide information collecting/transmitting apparatus 101. The program guide information producing apparatus 102 further comprises a common program guide information receiving section 202 which receives other broadcaster's common program guide information from the program guide information collecting/transmitting apparatus 101. A program guide information output section 203 receives the self-produced common program guide information from the common program guide information producing section 204 and also receives the other broadcaster's common program guide information from the common program guide information receiving section 202. The program guide information output section 203 outputs the received program guide information to a TS multiplexing apparatus 105 at predesignated time intervals.

The program organizing information, entered to the common program guide information producing section 204, includes the program related or channel related information, such as program ID, program name, program start/end time and program length. The common program guide information producing section 204 generates the self-produced common program guide information based on the received program organizing information. The program guide information, produced by the common program guide information producing section 204, has a transmission format described in a sectional format table regulated by the MPEG2 or ARIB technique. The transmission format consists of the PSI for selecting the audio/video data and SI for constituting the program guide table.

In this manner, each broadcaster generates self-produced common program guide information and transmits the produced self-produced common program guide information to the program guide information collecting/transmitting apparatus 101. Thus, the program guide information collecting/transmitting apparatus 101 collects the common program guide information transmitted from all broadcasters, and transmits other broadcaster's common program guide information to each broadcaster. For example, the broadcaster "A" receives other broadcaster's common program guide

information covering all broadcasters other than the broadcaster “A.”

In this manner, the common program guide information is substantially separated or classified into the self-produced common program guide information and the other broadcaster’s common program guide information. The common program guide information producing section 204 generates the self-produced common program guide information produced by itself. Thus, even when the program guide information collecting/transmitting apparatus 101 or the like is in trouble, it becomes possible to surely produce and output at least the self-produced common program guide information. Thus, each broadcaster’s TS can surely include at least the self-produced common program guide information without being adversely influenced by the troubles caused in other systems.

Furthermore, the program guide information output section 203 outputs the united program guide information including both the self-produced common program guide information and the other broadcaster’s common program guide information. Thus, in the transmission of the common program guide information covering all of the broadcasters, it becomes possible to continuously maintain the “Continuity Counter” which serves as an index of TS packet continuity. In general, the “Continuity Counter” is located at the header portion of the TS packet together with PID and others. Accordingly, each broadcast receiver 107 can surely obtain the TS packet relating to all broadcasters’ common program guide information.

As explained in a later-described sixth embodiment, the program guide information producing apparatus 102 may directly receive other broadcaster’s common program guide information from other broadcasting center system. In such a case, the obtained other broadcaster’s common program guide information is united with the self-produced common program guide information produced by its own broadcaster. The united common program guide information is output from the program guide information output section 203.

Second Embodiment

A program guide information collecting/transmitting system in accordance with a second embodiment of the present invention stores common program

guide information corresponding to a predetermined date/time in advance so as to overcome the problem caused by the troubles.

Fig. 3 shows a program guide information producing apparatus 102 of the second embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 20 (original system) in that an additionally provided section is a common program guide information storing section 205 which stores all broadcasters' common program guide information (i.e., the common program guide information covering all of the broadcasters).

Fig. 4 shows another program guide information producing apparatus 102 of the second embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 1 (first embodiment) in that an additionally provided section is a common program guide information storing section 205 which stores other broadcasters' common program guide information (i.e., the common program guide information covering other broadcasters).

In the program guide information producing apparatus 102, the common program guide information storing section 205 stores the all broadcasters' common program guide information or other broadcaster's common program guide information received from the program guide information collecting/transmitting apparatus 101 via the common program guide information receiving section 202. The common program guide information storing section 205 sends the stored common program guide information to the program guide information output section 203. At designated time intervals, the program guide information output section 203 outputs both the self-produced common program guide information and other broadcaster's common program guide information.

Fig. 5 shows the common program guide information stored in the common program guide information storing section 205. More specifically, the common program guide information storing section 205 administrates individual program guide information and broadcasting schedule information sent from the program guide information collecting/transmitting apparatus 101. The broadcasting schedule information describes the broadcast time (length, time

slot) of individual programs.

In Fig. 5, p/fEIT (present/following EIT) is one example of the sectional format table, which describes the program guide information relating to the presently broadcasted program and a following program which is to be next broadcasted. The p/fEIT information is used in the broadcast receiver 107 for displaying a program table of different channels' programs or for the audio/video tape recording control of the reserved programs.

Furthermore, a version number shown in Fig. 5 is used in device controls of the broadcast receiver 107. The version number is incremented in response to every renewal of the program guide information. Thus, the broadcast receiver 107 refers to the version number to check whether or not the program guide information has been renewed. The broadcast receiver 107 obtains the renewed program guide information (i.e., sectional format table) when the version number is incremented. According to the example shown in Fig. 5, the program guide information output section 203 outputs p/fEIT1 of version #1 at designated time intervals for a time duration from 1999/10/01, 00:00:00 to 1999/10/01, 01:00:00. Furthermore, the program guide information output section 203 outputs p/fEIT2 of version #2 at designated time intervals for a time duration from 1999/10/01, 01:00:00 to 1999/10/01, 01:30:00.

In this manner, the program guide information producing apparatus 102 has the common program guide information storing section 205 which stores the common program guide information (i.e., p/fEIT according to Fig. 5 example) for a designated date/time (several hours to several days) in advance. Therefore, even when acquirement of all broadcasters' common program guide information or other broadcasters' common program guide information is failed due to the trouble caused in any other broadcasting center system and/or the program guide information collecting/transmitting apparatus 101, it becomes possible to continuously output the pre-stored common program guide information for the predesignated time period in accordance with the predetermined broadcasting schedule.

Fig. 6 shows another example of the program guide information

collecting/transmitting apparatus 101 which comprises a common program guide information storing section 301. The common program guide information storing section 301 stores the common program guide information corresponding to a designated date/time sent from each broadcaster. According to this arrangement,
5 in the program guide information collecting/transmitting apparatus 101, the common program guide information storing section 301 receives, stores and administers the self-produced common program guide information sent from each broadcasting center system.

In this manner, providing the common program guide information storing section 301 in the program guide information collecting/transmitting apparatus 101 makes it possible for the program guide information producing apparatus 102 in each broadcasting center system to receive the other broadcaster's program guide information from the program guide information collecting/transmitting apparatus 101 even when the transmission route is temporarily troubled between a specific broadcasting center system and the program guide information collecting/transmitting apparatus 101. Thus, the program guide information producing apparatus 102 can surely output the all broadcasters' common program guide information.
10
15
20

When the program guide information producing apparatus 102 directly receives other broadcaster's common program guide information from each broadcasting center system, the obtained other broadcaster's common program guide information is stored in the common program guide information storing section 205 and sent to the program guide information output section 203.

Third Embodiment

A program guide information collecting/transmitting system in accordance with a third embodiment of the present invention comprises a program guide information producing apparatus which assigns a version number to all broadcasters' common program guide information or to other broadcasters' common program guide information.
25
30

As explained in the second embodiment, the broadcast receiver 107 refers to the version number to check whether or not the program guide information has

been renewed. When the version number is incremented by one, it means that the program guide information has been renewed once. Thus, the broadcast receiver 107 obtains the renewed program guide information. However, when the version number is incremented by two at a time, the broadcast receiver cannot obtain the program guide information. No renewal of program guide information is performed. This is referred as “version jump.”

The version jump occurs when each broadcasting center system fails to obtain other broadcaster's common program guide information due to the trouble caused in the program guide information collecting/transmitting apparatus 101 or the network. Thus, there is the possibility that the version jump may occur in the case where assignment of the version number to other broadcaster common program guide information is done by the program guide information collecting/transmitting apparatus 101 or any other broadcasting center system.

For example, it is supposed that a broadcasting center system fails to obtain other broadcaster's common program guide information of version number 2. And later, this broadcasting center system may obtain other broadcaster's common program guide information of version number 3. In such a case, the broadcast receiver 107 receives the other broadcaster's common program guide information whose version number was increased by 2 at a time. In other words, the version jump occurs.

Fig. 7 shows a program guide information producing apparatus 102 of the third embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 20 (original system) in that a version number adding section 206 is provided. Fig. 8 shows another program guide information producing apparatus 102 of the third embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 1 (first embodiment) in that the version number adding section 206 is provided.

As shown in Fig. 9, the version number adding section 206 assigns a version number to every common program guide information which has no version number yet when entered. The version number adding section 206 sends the common program guide information having an assigned version number to

The broadcaster “A” modifies both p/fEIT and shEIT when it changes the program guide information of a certain program, and transmits the modified EIT information to the program guide information collecting/transmitting apparatus 101. The p/fEIT information is used to control the audio/video tape recording preservation or the like in each broadcast receiver 107. When the program change is too urgent, there is the possibility that p/fEIT may not arrive in time at the broadcaster “N.” In such a case, a trouble will arise in the audio/video tape recording function of the broadcast receiver 107. To solve this problem, in the transmission of EIT-related information to the program guide information collecting/transmitting apparatus 101, the broadcaster “A” transmits the information relating to p/fEIT first and then transmits the information relating to shEIT later.

Fig. 11 shows a program guide information producing apparatus 102 of the fourth embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 20 (original system) in that a self-produced information stepwise transmitting section 207 which transmits self-produced information in a stepwise manner. Fig. 12 shows another program guide information producing apparatus 102 of the fourth embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 1 (first embodiment) in that the self-produced information stepwise transmitting section 207 is added.

The self-produced information stepwise transmitting section 207 transmits program organizing information or self-produced common program guide information to the program guide information collecting/transmitting apparatus 101 in the following order.

First, only p/fEIT, i.e., self-produced common program guide information, is sent to the program guide information collecting/transmitting apparatus 101. As shown in Fig. 10, the p/fEIT information having a relatively small data volume is sent first and the shEIT information having a relatively large data volume is sent later. With this arrangement, it becomes possible to transmit only p/fEIT to the broadcaster “N” at an earlier timing. This is effective to eliminate

the trouble in the audio/video tape recording function or the like of the broadcast receiver 107.

Fig. 13 is a schematic view showing another stepwise transmission of self-produced common program guide information in order of priority from the broadcaster “A” to the program guide information collecting/transmitting apparatus 101. More specifically, among the p/fEIT information (i.e., self-produced common program guide information), only the p/fEIT information relating to the presently broadcasted program (i.e., p/fEIT of the present version) is sent first to the program guide information collecting/transmitting apparatus 101. As shown in Fig. 13, the first transmitted information is the p/fEIT (version #2) relating to the presently broadcasted program. The next transmitted information is the p/fEIT (version #3) relating to the next broadcasted program and the remaining p/fEITs. The finally transmitted information is shEIT. With this arrangement, it becomes possible to more quickly transmit the p/fEIT of the presently broadcasted program to the broadcaster “N” in response to an urgent change of the program guide information.

Furthermore, when only the broadcast time (length, time slot) of the program is changed, the self-produced information transmitting section 201 transmits only the program guide information relating to the broadcast time (length, time slot) among the self-produced common program guide information to the program guide information collecting/transmitting apparatus 101. This makes it possible to quickly transmit the change in the broadcast time of the program to the program guide information producing apparatus of other broadcaster.

Fifth Embodiment

A program guide information collecting/transmitting system in accordance with a fifth embodiment of the present invention comprises a program guide information producing apparatus 102 which has the capability of checking whether or not correct self-produced program guide information has been transmitted from the program guide information collecting/transmitting apparatus 101.

5

10

15
20
25
30

Fig. 14 shows a program guide information producing apparatus 102 of the fifth embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 20 (original system) in that a self-produced information checking section 208 is added, although Fig. 14 does not show the common program guide information receiving section 202 and the program guide information output section 203. Fig. 15 shows another program guide information producing apparatus 102 of the fifth embodiment which differs from the program guide information producing apparatus 102 shown in Fig. 1 (first embodiment) in that the self-produced information checking section 208 is added, although Fig. 15 does not show the common program guide information receiving section 202 and the program guide information output section 203.

The self-produced information checking section 208 obtains the self-produced information stored in the program guide information collecting/transmitting apparatus 101, and checks whether or not the self-produced information has been correctly transmitted from the self-produced information transmitting section 201 to the program guide information collecting/transmitting apparatus 101.

Accordingly, providing the self-produced information checking section 208 in the program guide information producing apparatus 102 makes it possible to check whether or not the self-produced common program guide information or the self-produced program organizing information has been correctly transmitted to the program guide information collecting/transmitting apparatus 101, or makes it possible to check whether or not the self-produced common program guide information has been modified or tampered by someone else.

25

Sixth Embodiment

30

A program guide information collecting/transmitting system in accordance with a sixth embodiment of the present invention comprises no program guide information collecting/transmitting apparatus 101. According to the sixth embodiment, the program guide information producing apparatus of each broadcaster directly transmits and receives the program guide information to and from the program guide information producing apparatus of another

broadcaster.

Fig. 16 shows a schematic view showing a digital broadcasting system in accordance with the sixth embodiment of the present invention. According to this system, each broadcasting center system includes a program guide information producing apparatus 102 which generates self-produced common program guide information and directly transmits or receives the self-produced common program guide information to or from the program guide information producing apparatus 102 of other broadcasting center system via digital leased line, ISDN, Internet or the like.

Fig. 17 shows a schematic arrangement of the program guide information producing apparatus 102 in accordance with the sixth embodiment. The program guide information producing apparatus 102 comprises an inter-station self-produced information transmitting section 209 and an inter-station common program guide information receiving section 210 to perform direct communication between any two broadcasters. The inter-station self-produced information transmitting section 209 directly transmits self-produced common program guide information to other broadcasters. The inter-station common program guide information receiving section 210 directly receives other broadcaster's common program guide information from other broadcasters.

In this manner, the self-produced common program guide information generated in each broadcaster is directly transmitted to other broadcasters without using the program guide information collecting/transmitting apparatus 101. Thus, it becomes possible to reduce the operational cost such as the operator expenses required in using the program guide information collecting/transmitting apparatus 101. In other words, in the digital broadcasting system, transmission/reception of the common program guide information can be realized with a low operational cost.

Needless to say, it is possible to constitute the program guide information producing apparatus of the present invention by combining some of the arrangements mutually disclosed in above-described different embodiments.

Effects of The Invention

As apparent from the above-described embodiments, the program guide information producing apparatus and the program guide information collecting/transmitting system have the following effects.

When the program guide information producing apparatus comprises the common program guide information producing section which is capable of generating the self-produced common program guide information, the present invention makes it possible to generate the self-produced common program guide information even when the program guide information collecting/transmitting system or the like is in trouble. Accordingly, each broadcaster can transmit its own TS containing the self-produced common program guide information without being adversely influenced by other systems.

Furthermore, when the self-produced common program guide information is united with other broadcaster's common program guide information so as to output all broadcasters' common program guide information (i.e., the united common program guide information), the present invention makes it possible to continuously maintain the "Continuity Counter" which serves as an index of TS packet continuity.

Furthermore, when the program guide information producing apparatus or the program guide information collecting/transmitting system comprises the common program guide information storing section, the common program guide information storing section stores other broadcaster's common program guide information corresponding to a pre-designated time duration in advance. Thus, the present invention makes it possible to continuously output the stored other broadcaster's common program guide information for the designated duration even when other broadcasting center system or the program guide information collecting/transmitting system is in trouble.

Furthermore, when the program guide information producing apparatus comprises the version number adding section, it becomes possible to eliminate the version jump even when the acquirement of other broadcaster's common program guide information is failed due to trouble in the network connecting the program guide information producing apparatus and the program guide

information collecting/transmitting apparatus.

Furthermore, when the program guide information producing apparatus comprises the self-produced information stepwise transmitting section, the audio/video tape recording reservation function in each broadcast receiver can work properly even when the program guide information is suddenly changed.

Furthermore, when the program guide information producing apparatus comprises the self-produced information checking section, it becomes possible to check whether or not the information has been correctly transmitted to the program guide information collecting/transmitting apparatus, or it becomes possible to check whether or not the information has been modified or tampered by someone else.

Moreover, when the broadcasters have the capability of directly transmitting and receiving the common program guide information, it becomes possible to reduce the operational cost such as the operator expenses required in using the program guide information collecting/transmitting apparatus.

This invention may be embodied in several forms without departing from the spirit of essential characteristics thereof. The present embodiments as described are therefore intended to be only illustrative and not restrictive, since the scope of the invention is defined by the appended claims rather than by the description preceding them. All changes that fall within the metes and bounds of the claims, or equivalents of such metes and bounds, are therefore intended to be embraced by the claims.

What is claimed is:

1. A program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, said program guide information producing apparatus comprising a common program guide information producing section which produces self-produced common program guide information.

2. The program guide information producing apparatus in accordance with claim 1, further comprising a program guide information output section which unites said self-produced common program guide information with other broadcaster's common program guide information, and outputs the united common program guide information.

3. A program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, said program guide information producing apparatus comprising a common program guide information storing section which stores common program guide information corresponding to a designated time duration in advance, said common program guide information being received from a program guide information collecting/transmitting apparatus or other broadcaster.

4. The program guide information producing apparatus in accordance with claim 2, further comprising a common program guide information storing section which stores the other broadcaster's common program guide information corresponding to a designated time duration in advance.

5. A program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, said program guide information producing apparatus comprising a

self-produced information transmitting section which transmits only the information relating to broadcast time of programs to a program guide information collecting/transmitting apparatus.

5 6. A program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, said program guide information producing apparatus comprising a version number adding section which adds a version number to common program guide information received from a program guide information collecting/transmitting apparatus or other broadcaster.

10 7. The program guide information producing apparatus in accordance with claim 2, further comprising a version number adding section which adds a version number to said self-produced common program guide information and also to said other broadcaster's common program guide information.

20 8. A program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, said program guide information producing apparatus comprising a self-produced information stepwise transmitting section which transmits control information prior to other information when renewed self-produced information is sent to a program guide information collecting/transmitting apparatus, said control information being used for audio/video recording preservation in a broadcast receiver.

25 9. The program guide information producing apparatus in accordance with claim 1, further comprising a self-produced information stepwise transmitting section which transmits control information prior to other information when renewed self-produced information is sent to a program guide information collecting/transmitting apparatus, said control information being used for audio/video recording preservation in a broadcast receiver.

5

10. The program guide information producing apparatus in accordance with claim 8, wherein said self-produced information stepwise transmitting section transmits only the control information relating to a presently broadcasted program to said program guide information collecting/transmitting apparatus prior to others among said control information relating to the audio/video recording preservation in the broadcast receiver.

10

11. A program guide information producing apparatus for outputting self-produced program guide information and other broadcaster's program guide information, said program guide information producing apparatus comprising a self-produced information checking section which obtains and checks self-produced information stored in a program guide information collecting/transmitting apparatus after said self-produced information is transmitted to said program guide information collecting/transmitting apparatus.

15

20

12. The program guide information producing apparatus in accordance with claim 1, further comprising a self-produced information checking section which obtains and checks said self-produced common program guide information stored in a program guide information collecting/transmitting apparatus after said self-produced common program guide information is transmitted to said program guide information collecting/transmitting apparatus.

25

13. A program guide information collecting/transmitting system including a program guide information collecting/transmitting apparatus for transmitting program guide information to other broadcasters, wherein

each broadcaster generates self-produced common program guide information and transmits the self-produced common program guide information to said program guide information collecting/transmitting apparatus,

30

said program guide information collecting/transmitting apparatus transmits the received self-produced common program guide information of said each

broadcaster to other broadcasters, and

 said other broadcasters receive the transmitted self-produced common program guide information of said each broadcaster as common program guide information produced by a different broadcaster.

5

14. The program guide information collecting/transmitting system in accordance with claim 13, wherein said program guide information collecting/transmitting apparatus comprises a common program guide information storing section which administers the self-produced common program guide information transmitted from said each broadcaster.

10

15. The program guide information collecting/transmitting system in accordance with claim 14, wherein

 said each broadcaster transmits the self-produced common program guide information corresponding to a designated time duration to said program guide information collecting/transmitting apparatus, and

 said program guide information collecting/transmitting apparatus causes said common program guide information storing section to store the received self-produced common program guide information transmitted from said each broadcaster during said designated time duration.

20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
155
160
165
170
175
180
185
190
195
200
205
210
215
220
225
230
235
240
245
250
255
260
265
270
275
280
285
290
295
300
305
310
315
320
325
330
335
340
345
350
355
360
365
370
375
380
385
390
395
400
405
410
415
420
425
430
435
440
445
450
455
460
465
470
475
480
485
490
495
500
505
510
515
520
525
530
535
540
545
550
555
560
565
570
575
580
585
590
595
600
605
610
615
620
625
630
635
640
645
650
655
660
665
670
675
680
685
690
695
700
705
710
715
720
725
730
735
740
745
750
755
760
765
770
775
780
785
790
795
800
805
810
815
820
825
830
835
840
845
850
855
860
865
870
875
880
885
890
895
900
905
910
915
920
925
930
935
940
945
950
955
960
965
970
975
980
985
990
995
1000
1005
1010
1015
1020
1025
1030
1035
1040
1045
1050
1055
1060
1065
1070
1075
1080
1085
1090
1095
1100
1105
1110
1115
1120
1125
1130
1135
1140
1145
1150
1155
1160
1165
1170
1175
1180
1185
1190
1195
1200
1205
1210
1215
1220
1225
1230
1235
1240
1245
1250
1255
1260
1265
1270
1275
1280
1285
1290
1295
1300
1305
1310
1315
1320
1325
1330
1335
1340
1345
1350
1355
1360
1365
1370
1375
1380
1385
1390
1395
1400
1405
1410
1415
1420
1425
1430
1435
1440
1445
1450
1455
1460
1465
1470
1475
1480
1485
1490
1495
1500
1505
1510
1515
1520
1525
1530
1535
1540
1545
1550
1555
1560
1565
1570
1575
1580
1585
1590
1595
1600
1605
1610
1615
1620
1625
1630
1635
1640
1645
1650
1655
1660
1665
1670
1675
1680
1685
1690
1695
1700
1705
1710
1715
1720
1725
1730
1735
1740
1745
1750
1755
1760
1765
1770
1775
1780
1785
1790
1795
1800
1805
1810
1815
1820
1825
1830
1835
1840
1845
1850
1855
1860
1865
1870
1875
1880
1885
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
2060
2065
2070
2075
2080
2085
2090
2095
2100
2105
2110
2115
2120
2125
2130
2135
2140
2145
2150
2155
2160
2165
2170
2175
2180
2185
2190
2195
2200
2205
2210
2215
2220
2225
2230
2235
2240
2245
2250
2255
2260
2265
2270
2275
2280
2285
2290
2295
2300
2305
2310
2315
2320
2325
2330
2335
2340
2345
2350
2355
2360
2365
2370
2375
2380
2385
2390
2395
2400
2405
2410
2415
2420
2425
2430
2435
2440
2445
2450
2455
2460
2465
2470
2475
2480
2485
2490
2495
2500
2505
2510
2515
2520
2525
2530
2535
2540
2545
2550
2555
2560
2565
2570
2575
2580
2585
2590
2595
2600
2605
2610
2615
2620
2625
2630
2635
2640
2645
2650
2655
2660
2665
2670
2675
2680
2685
2690
2695
2700
2705
2710
2715
2720
2725
2730
2735
2740
2745
2750
2755
2760
2765
2770
2775
2780
2785
2790
2795
2800
2805
2810
2815
2820
2825
2830
2835
2840
2845
2850
2855
2860
2865
2870
2875
2880
2885
2890
2895
2900
2905
2910
2915
2920
2925
2930
2935
2940
2945
2950
2955
2960
2965
2970
2975
2980
2985
2990
2995
3000
3005
3010
3015
3020
3025
3030
3035
3040
3045
3050
3055
3060
3065
3070
3075
3080
3085
3090
3095
3100
3105
3110
3115
3120
3125
3130
3135
3140
3145
3150
3155
3160
3165
3170
3175
3180
3185
3190
3195
3200
3205
3210
3215
3220
3225
3230
3235
3240
3245
3250
3255
3260
3265
3270
3275
3280
3285
3290
3295
3300
3305
3310
3315
3320
3325
3330
3335
3340
3345
3350
3355
3360
3365
3370
3375
3380
3385
3390
3395
3400
3405
3410
3415
3420
3425
3430
3435
3440
3445
3450
3455
3460
3465
3470
3475
3480
3485
3490
3495
3500
3505
3510
3515
3520
3525
3530
3535
3540
3545
3550
3555
3560
3565
3570
3575
3580
3585
3590
3595
3600
3605
3610
3615
3620
3625
3630
3635
3640
3645
3650
3655
3660
3665
3670
3675
3680
3685
3690
3695
3700
3705
3710
3715
3720
3725
3730
3735
3740
3745
3750
3755
3760
3765
3770
3775
3780
3785
3790
3795
3800
3805
3810
3815
3820
3825
3830
3835
3840
3845
3850
3855
3860
3865
3870
3875
3880
3885
3890
3895
3900
3905
3910
3915
3920
3925
3930
3935
3940
3945
3950
3955
3960
3965
3970
3975
3980
3985
3990
3995
4000
4005
4010
4015
4020
4025
4030
4035
4040
4045
4050
4055
4060
4065
4070
4075
4080
4085
4090
4095
4100
4105
4110
4115
4120
4125
4130
4135
4140
4145
4150
4155
4160
4165
4170
4175
4180
4185
4190
4195
4200
4205
4210
4215
4220
4225
4230
4235
4240
4245
4250
4255
4260
4265
4270
4275
4280
4285
4290
4295
4300
4305
4310
4315
4320
4325
4330
4335
4340
4345
4350
4355
4360
4365
4370
4375
4380
4385
4390
4395
4400
4405
4410
4415
4420
4425
4430
4435
4440
4445
4450
4455
4460
4465
4470
4475
4480
4485
4490
4495
4500
4505
4510
4515
4520
4525
4530
4535
4540
4545
4550
4555
4560
4565
4570
4575
4580
4585
4590
4595
4600
4605
4610
4615
4620
4625
4630
4635
4640
4645
4650
4655
4660
4665
4670
4675
4680
4685
4690
4695
4700
4705
4710
4715
4720
4725
4730
4735
4740
4745
4750
4755
4760
4765
4770
4775
4780
4785
4790
4795
4800
4805
4810
4815
4820
4825
4830
4835
4840
4845
4850
4855
4860
4865
4870
4875
4880
4885
4890
4895
4900
4905
4910
4915
4920
4925
4930
4935
4940
4945
4950
4955
4960
4965
4970
4975
4980
4985
4990
4995
5000
5005
5010
5015
5020
5025
5030
5035
5040
5045
5050
5055
5060
5065
5070
5075
5080
5085
5090
5095
5100
5105
5110
5115
5120
5125
5130
5135
5140
5145
5150
5155
5160
5165
5170
5175
5180
5185
5190
5195
5200
5205
5210
5215
5220
5225
5230
5235
5240
5245
5250
5255
5260
5265
5270
5275
5280
5285
5290
5295
5300
5305
5310
5315
5320
5325
5330
5335
5340
5345
5350
5355
5360
5365
5370
5375
5380
5385
5390
5395
5400
5405
5410
5415
5420
5425
5430
5435
5440
5445
5450
5455
5460
5465
5470
5475
5480
5485
5490
5495
5500
5505
5510
5515
5520
5525
5530
5535
5540
5545
5550
5555
5560
5565
5570
5575
5580
5585
5590
5595
5600
5605
5610
5615
5620
5625
5630
5635
5640
5645
5650
5655
5660
5665
5670
5675
5680
5685
5690
5695
5700
5705
5710
5715
5720
5725
5730
5735
5740
5745
5750
5755
5760
5765
5770
5775
5780
5785
5790
5795
5800
5805
5810
5815
5820
5825
5830
5835
5840
5845
5850
5855
5860
5865
5870
5875
5880
5885
5890
5895
5900
5905
5910
5915
5920
5925
5930
5935
5940
5945
5950
5955
5960
5965
5970
5975
5980
5985
5990
5995
6000
6005
6010
6015
6020
6025
6030
6035
6040
6045
6050
6055
6060
6065
6070
6075
6080
6085
6090
6095
6100
6105
6110
6115
6120
6125
6130
6135
6140
6145
6150
6155
6160
6165
6170
6175
6180
6185
6190
6195
6200
6205
6210
6215
6220
6225
6230
6235
6240
6245
6250
6255
6260
6265
6270
6275
6280
6285
6290
6295
6300
6305
6310
6315
6320
6325
6330
6335
6340
6345
6350
6355
6360
6365
6370
6375
6380
6385
6390
6395
6400
6405
6410
6415
6420
6425
6430
6435
6440
6445
6450
6455
6460
6465
6470
6475
6480
6485
6490
6495
6500
6505
6510
6515
6520
6525
6530
6535
6540
6545
6550
6555
6560
6565
6570
6575
6580
6585
6590
6595
6600
6605
6610
6615
6620
6625
6630
6635
6640
6645
6650
6655
6660
6665
6670
6675
6680
6685
6690
6695
6700
6705
6710
6715
6720
6725
6730
6735
6740
6745
6750
6755
6760
6765
6770
6775
6780
6785
6790
6795
6800
6805
6810
6815
6820
6825
6830
6835
6840
6845
6850
6855
6860
6865
6870
6875
6880
6885
6890
6895
6900
6905
6910
6915
6920
6925
6930
6935
6940
6945
6950
6955
6960
6965
6970
6975
6980
6985
6990
6995
7000
7005
7010
7015
7020
7025
7030
7035
7040
7045
7050
7055
7060
7065
7070
7075
7080
7085
7090
7095
7100
7105
7110
7115
7120
7125
7130
7135
7140
7145
7150
7155
7160
7165
7170
7175
7180
7185
7190
7195
7200
7205
7210
7215
7220
7225
7230
7235
7240
7245
7250
7255
7260
7265
7270
7275
7280
7285
7290
7295
7300
7305
7310
7315
7320
7325
7330
7335
7340
7345
7350
7355
7360
7365
7370
7375
7380
7385
7390
7395
7400
7405
7410
7415
7420
7425
7430
7435
7440
7445
7450
7455
7460
7465
7470
7475
7480
7485
7490
7495
7500
7505
7510
7515
7520
7525
7530
7535
7540
7545
7550
7555
7560
7565
7570
7575
7580
7585
7590
7595
7600
7605
7610
7615
7620
7625
7630
7635
7640
7645
7650
7655
7660
7665
7670
7675
7680
7685
7690
7695
7700
7705
7710
7715
7720
7725
7730
7735
7740
7745
7750
7755
7760
7765
7770
7775
7780
7785
7790
7795
7800
7805
7810
7815
7820
7825
7830
7835
7840
7845
7850
7855
7860
7865
7870
7875
7880
7885
7890
7895
7900
7905
7910
7915
7920
7925
7930
7935
7940
7945
7950
7955
7960
7965
7970
7975
7980
7985
7990
7995
8000
8005
8010
8015
8020
8025
8030
8035
8040
8045
8050
8055
8060
8065
8070
8075
8080
8085
8090
8095
8100
8105
8110
8115
8120
8125
8130
8135
8140
8145
8150
8155
8160
8165
8170
8175
8180
8185
8190
8195
8200
8205
8210
8215
8220
8225
8230
8235
8240
8245
8250
8255
8260
8265
8270
8275
8280
8285
8290
8295
8300
8305
8310
8315
8320
8325
8330
8335
8340
8345
8350
8355
8360
8365
8370
8375
8380
8385
8390
8395
8400
8405
8410
8415
8420
8425
8430
8435
8440
8445
8450
8455
8460
8465
8470
8475
8480
8485
8490
8495
8500
8505
8510
8515
8520
8525
8530
8535
8540
8545
8550
8555
8560
8565
8570
8575
8580
8585
8590
8595
8600
8605
8610
8615
8620
8625
8630
8635
8640
8645
8650
8655
8660
8665
8670
8675
8680
8685
8690
8695
8700
8705
8710
8715
8720
8725
8730
8735
8740
8745
8750
8755
8760
8765
8770
8775
8780
8785
8790
8795
8800
8805
8810
8815
8820
8825
8830
8835
8840
8845
8850
8855
8860
8865
8870
8875
8880
8885
8890
8895
8900
8905
8910
8915
8920
8925
8930
8935
8940
8945
8950
8955
8960
8965
8970
8975
8980
8985
8990
8995
9000
9005
9010
9015
9020
9025
9030
9035
9040
9045
9050
9055
9060
9065
9070
9075
9080
9085
9090
9095
9100
9105
9110
9115
9120
9125
9130
9135
9140
9145
9150
9155
9160
9165
9170
9175
9180
9185
9190
9195
9200
9205
9210
9215
9220
9225
9230
9235
9240
9245
9250
9255
9260
9265
9270
9275
9280
9285
9290
9295<br

1, further comprising:

an inter-station self-produced information transmitting section which directly transmits said self-produced common program guide information; and

5 an inter-station common program guide information receiving section which directly receives said other broadcaster's common program guide information from said other broadcaster.

10 18. The program guide information producing apparatus in accordance with claim 9, wherein said self-produced information stepwise transmitting section transmits only the control information relating to a presently broadcasted program to said program guide information collecting/transmitting apparatus prior to others among said control information relating to the audio/video recording preservation in the broadcast receiver.

ABSTRACT OF THE DISCLOSURE

A program guide information producing apparatus outputs self-produced program guide information and other broadcaster's program guide information.

- 5 In the program guide information producing apparatus, a common program guide information producing section generates self-produced common program guide information. Furthermore, a program guide information output section unites the self-produced common program guide information with other broadcaster's common program guide information received from a program guide information collecting/transmitting apparatus and outputs the united common program guide information. Thus, the self-produced common program guide information is surely output even when the program guide information collecting/transmitting apparatus or the like is in trouble.

10

15

FIG. 1

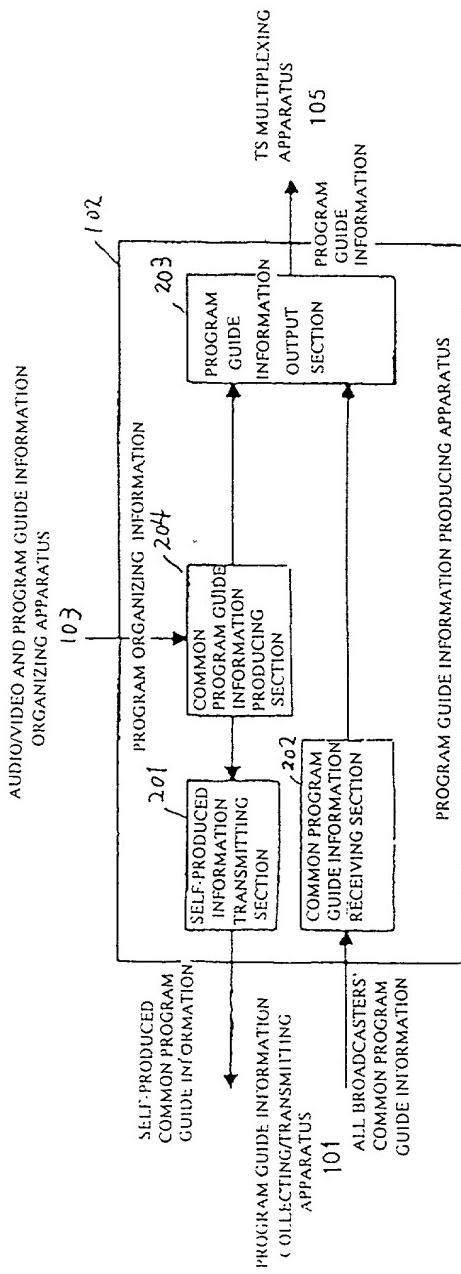


FIG. 3

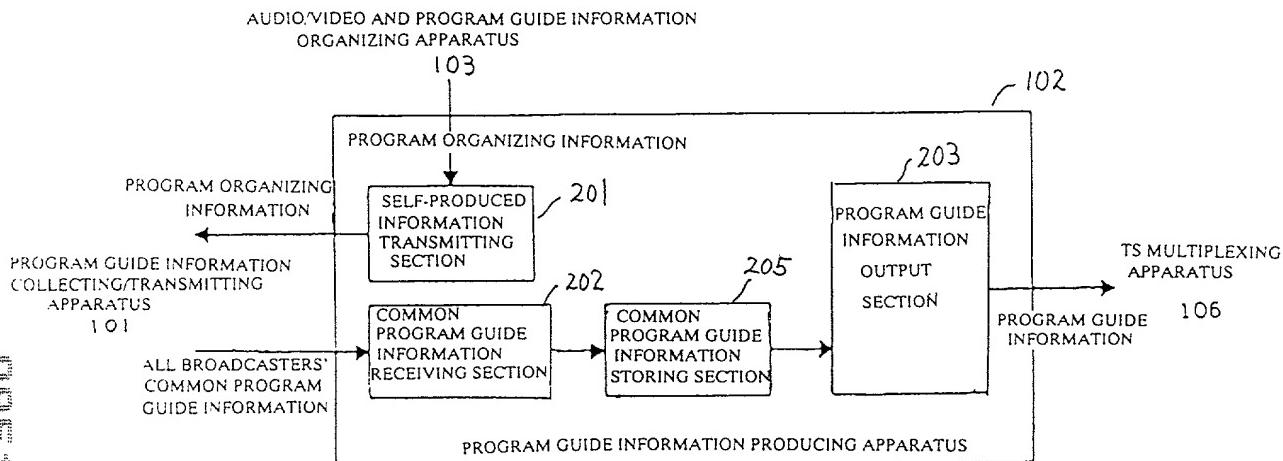


FIG. 4

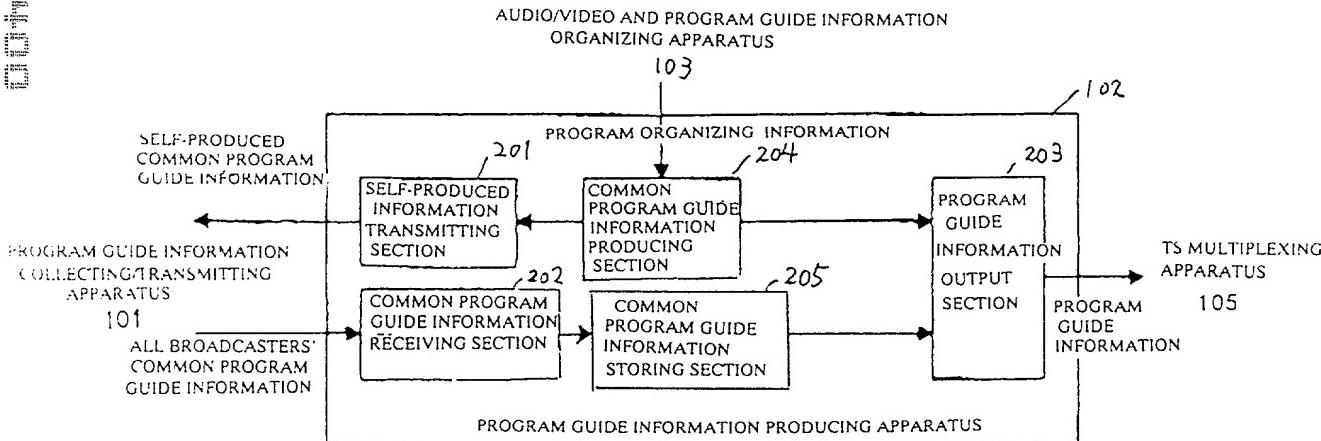


FIG. 5

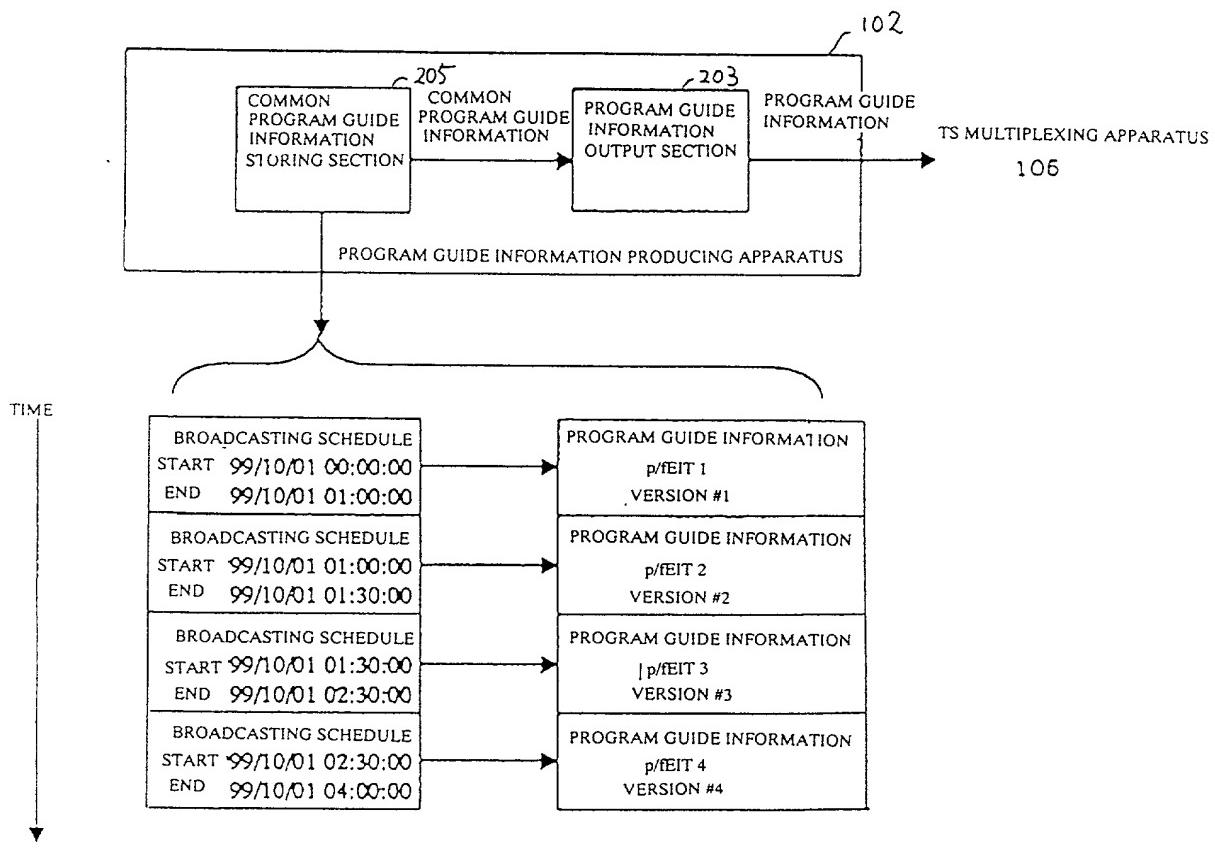


FIG. 6

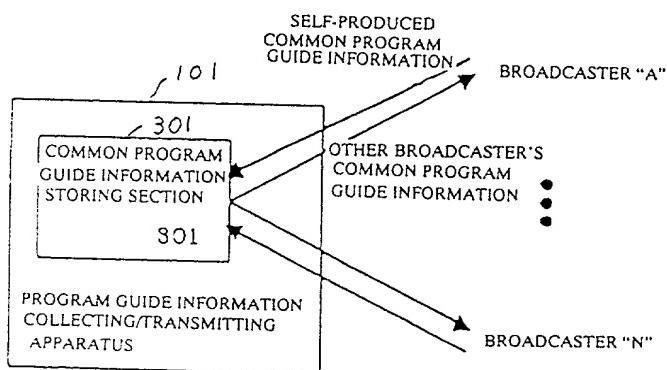


FIG. 7

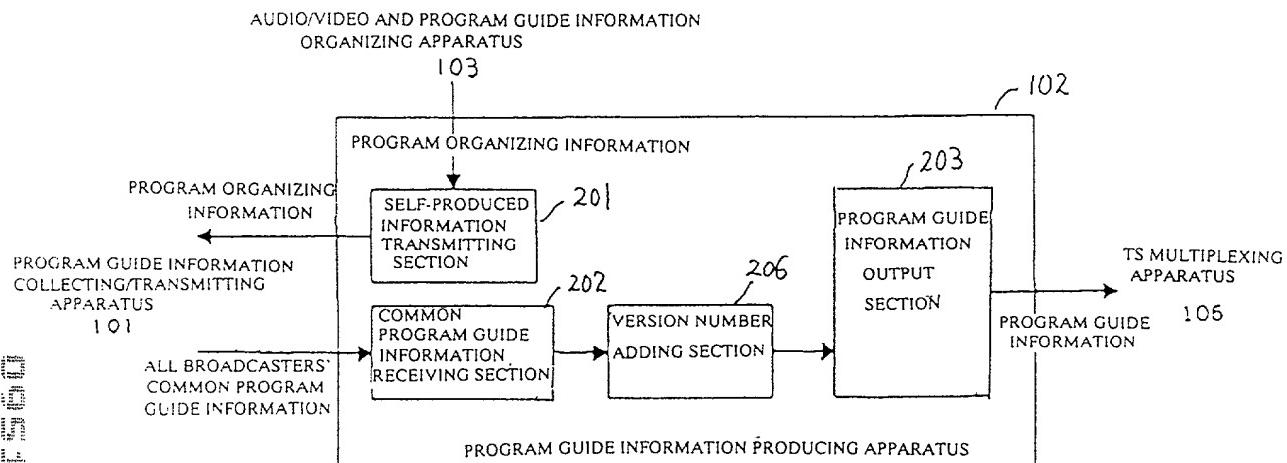


FIG. 8

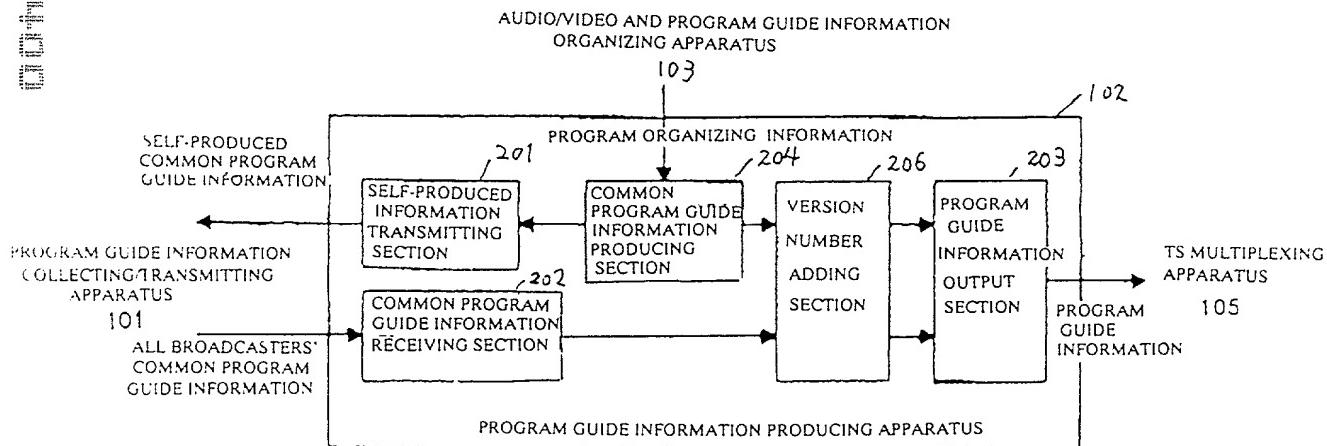


FIG. 9

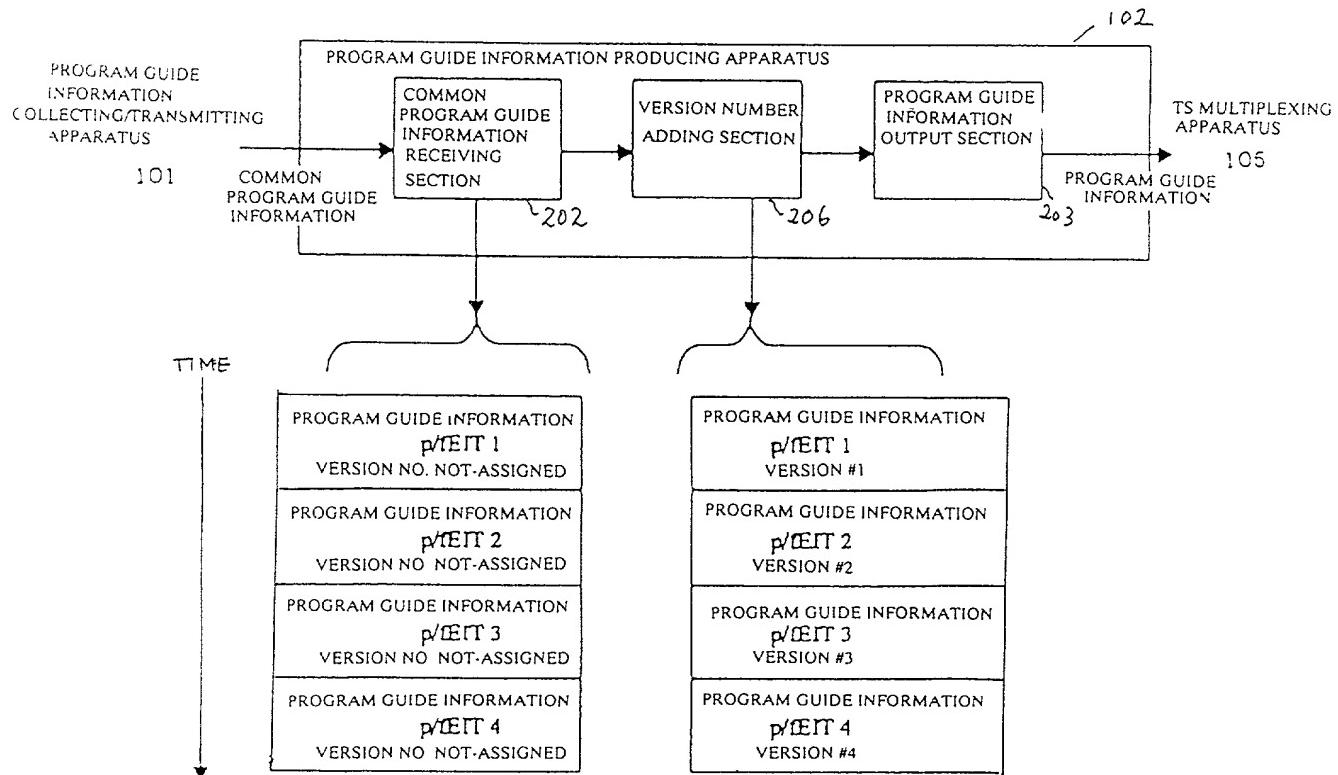


FIG. 10

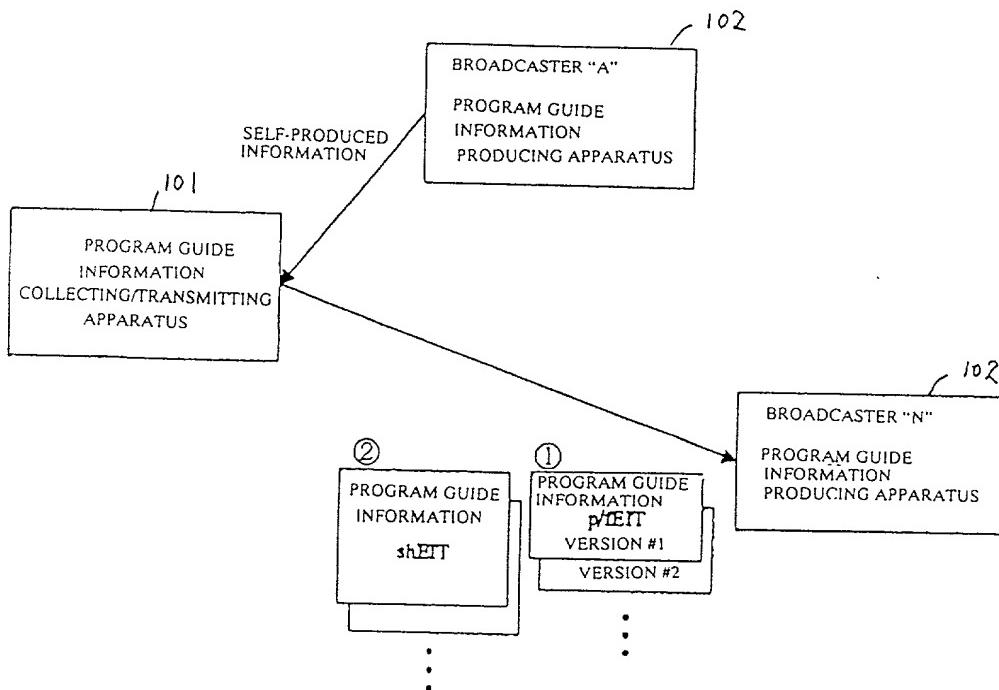


FIG. 13

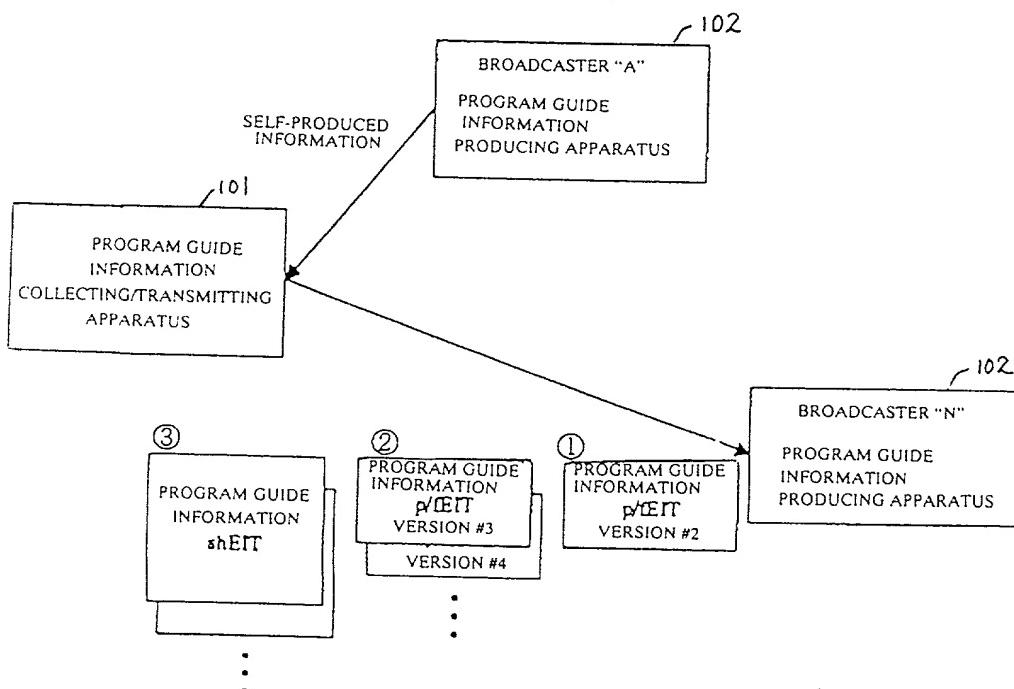


FIG. 11

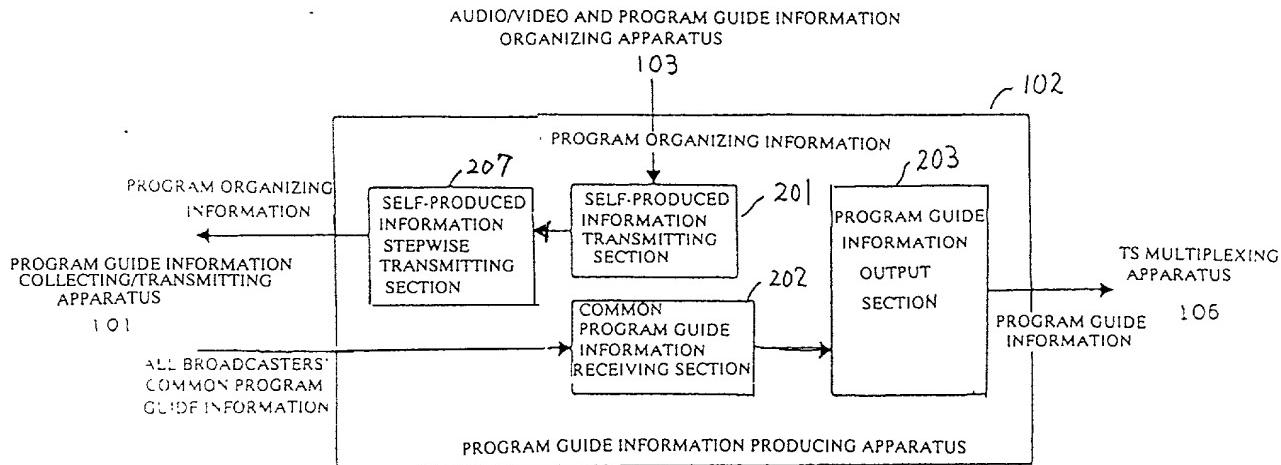
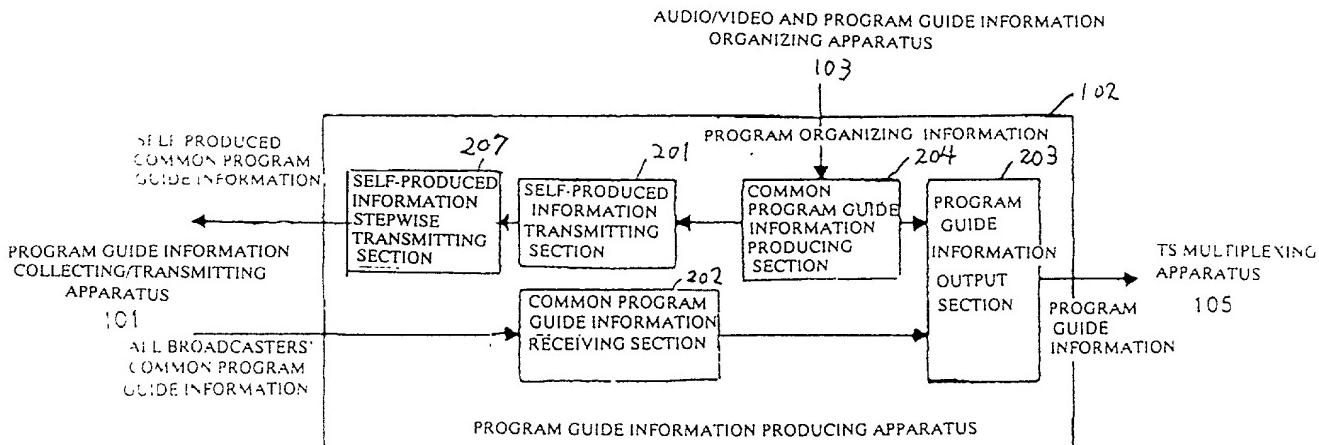


FIG. 12



9/
12

FIG. 14

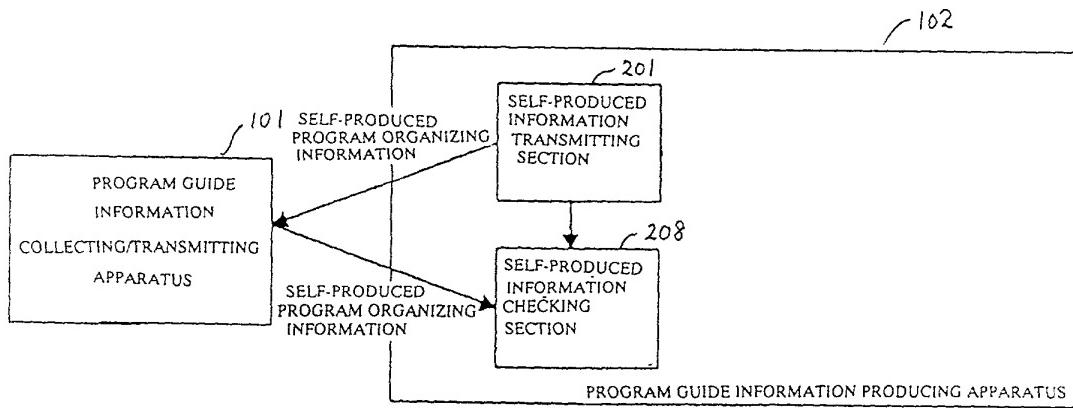


FIG. 15

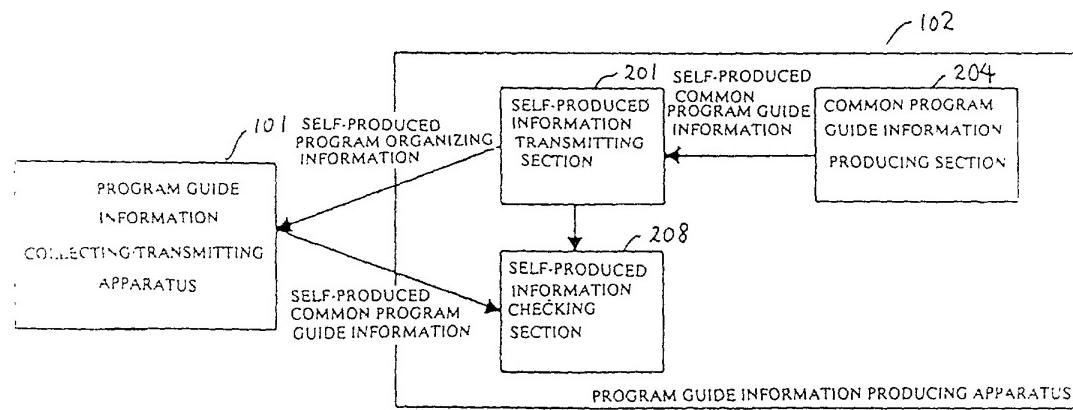


FIG. 16

10 /
12

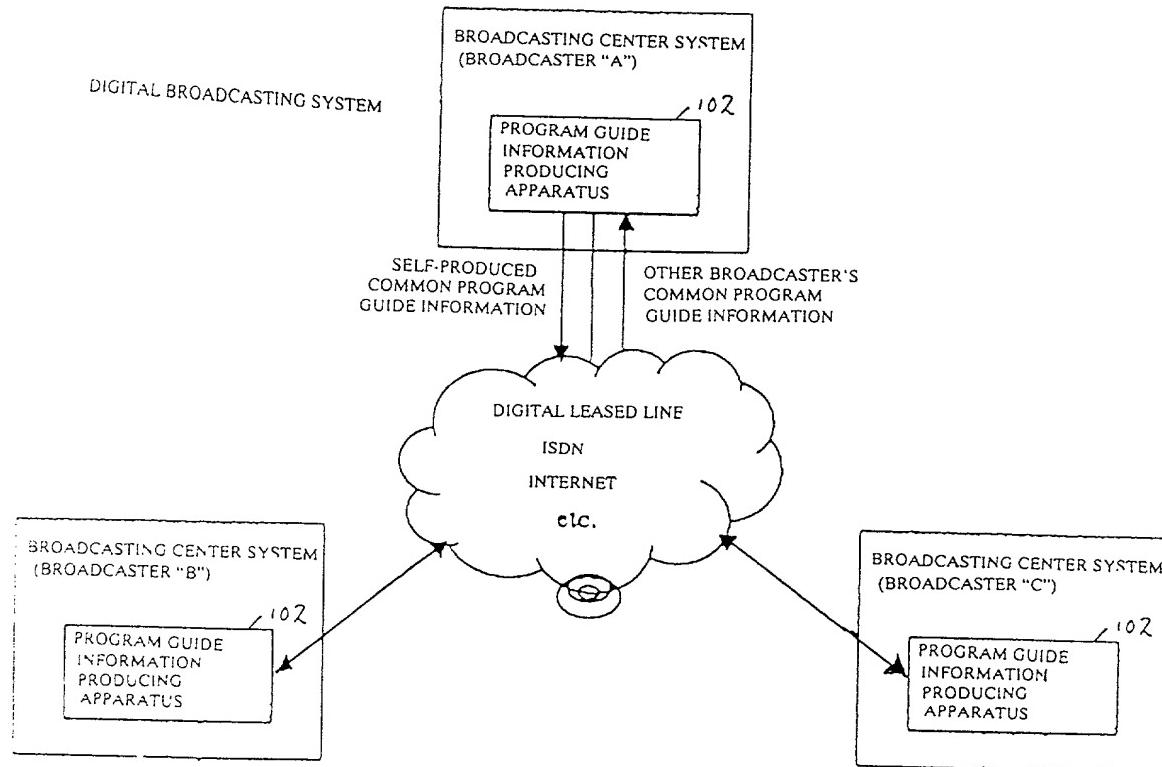
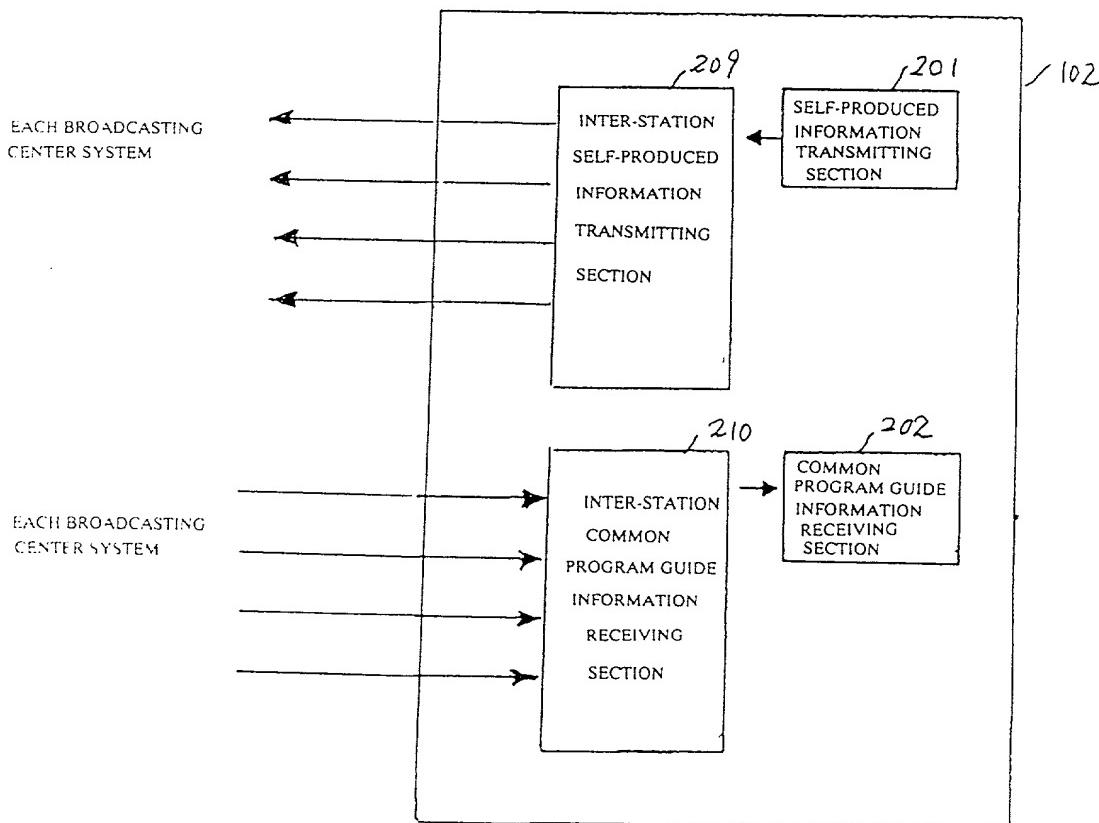


FIG. 17



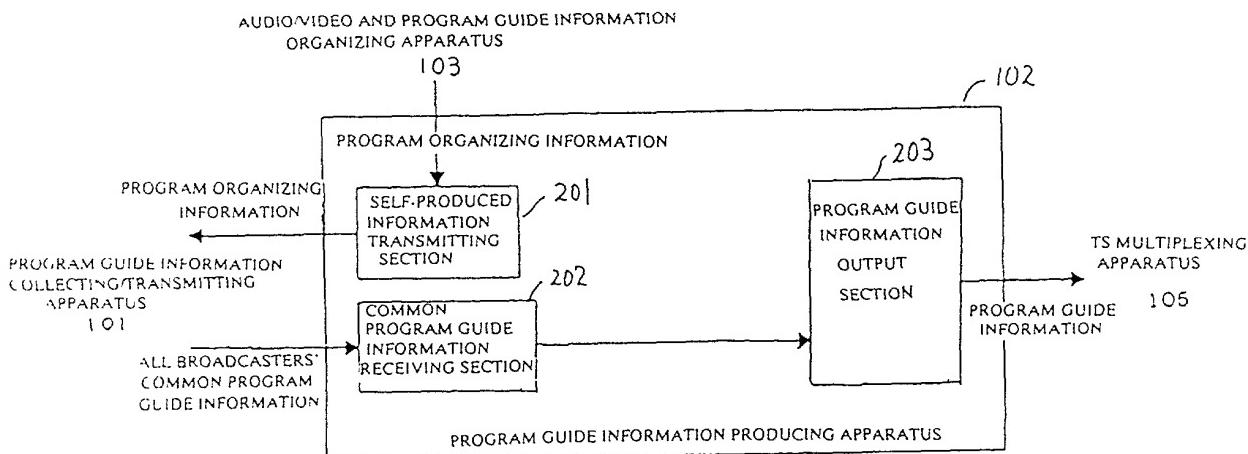
12/12

FIG. 19

CLASSIFICATION OF PROGRAM GUIDE INFORMATION

COMMON PROGRAM GUIDE INFORMATION EXAMPLES: *BRIEF EXPLANATION OF PROGRAM GUIDE TABLE *AUDIO/VIDEO TAPE RECORDING RESERVATION FUNCTION	PROGRAM GUIDE INFORMATION COMMONLY TRANSMITTED BY ALL TRANSPORT STREAMS	SELF-PRODUCED COMMON PROGRAM GUIDE INFORMATION -----DESCRIBING COMMON PROGRAM GUIDE INFORMATION RELATING TO SELF-PRODUCED PROGRAM CONTENTS
		OTHER BROADCASTER'S COMMON PROGRAM GUIDE INFORMATION -----DESCRIBING COMMON PROGRAM GUIDE INFORMATION RELATING TO OTHER BROADCASTER'S PROGRAM CONTENTS
INDIVIDUAL PROGRAM GUIDE INFORMATION EXAMPLES: *DETAILED EXPLANATION OF PROGRAM GUIDE TABLE *PROGRAM DISPLAY OF SERIES DRAMA	PROGRAM GUIDE INFORMATION INDIVIDUALLY TRANSMITTED BY TRANSPORT STREAM OF EACH BROADCASTER	

FIG. 20



DECLARATION FOR PATENT APPLICATION

Page One of Two

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: PROGRAM GUIDE INFORMATION PRODUCING APPARATUS AND RELATED PROGRAM GUIDE INFORMATION COLLECTING/TRANSMITTING SYSTEM
 the specification of which: (check one)

is attached hereto. was filed on 19, as United States Patent Application Serial No. or PCT International Application Number _____, and was amended on 19 (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 CFR § 1.56(a).

Prior Foreign Application(s): I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate listed below, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

		Priority Claimed	
<u>11-48090</u> (Application No.)	<u>Japan</u> (Country)	<u>February 25, 1999</u> (Day/Month/Year Filed)	<input checked="" type="checkbox"/> [] Yes No [] []
<u> </u> (Application No.)	<u> </u> (Country)	<u> </u> (Day/Month/Year Filed)	<input type="checkbox"/> Yes No [] []
<u> </u> (Application No.)	<u> </u> (Country)	<u> </u> (Day/Month/Year Filed)	<input type="checkbox"/> Yes No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

Application No.	Filing Date
_____	_____

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by 35 U.S.C. § 112, first paragraph, I acknowledge the duty to disclose material information as defined in 37 CFR § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

<u>(U.S. Application Serial No.)</u>	<u>(U.S. Filing Date)</u>	<u>(Status--patented, pending, abandoned)</u>
<u>(U.S. Application Serial No.)</u>	<u>(U.S. Filing Date)</u>	<u>(Status--patented, pending, abandoned)</u>

I hereby appoint Elliott I. Pollock, Registration No. 16,906; George Vande Sande, Registration No. 17,276; Burton A. Amernick, Registration No. 24,852; Stanley B. Green, Registration No. 24,351; Richard Wiener, Registration No. 18,741; Townsend M. Belser, Jr., Registration No. 22,956; Morris Liss, Registration No. 24,510; Martin Abramson, Registration No. 25,787; George R. Petit, Registration No. 27,369; Elzbieta Chlopecka, Registration No. 32,767; Eric J. Franklin, Registration No. 37,134; and Jeffri A. Kaminski, Reg. No. 42,709, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Send Correspondence and Direct Telephone Calls to:

Morris Liss
(202) 331-7111

Morris Liss
Pollock, Vande Sande & Amernick, R.L.L.P.
P.O. Box 19088
Washington, D.C. 20036-3425 U.S.A.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Toru Nakada

Inventor's Signature Toru Nakada Date February 7, 2000

Residence Address Tokyo, Japan

Citizenship Japanese

Post Office Address 1-36-B304, Toshin-cho, Itabashi-ku, Tokyo 174-0074 Japan

See next page for additional inventors

DECLARATION FOR PATENT APPLICATION

Page Two

Full name of second joint inventor (if any): Takeshi Nagao

Inventor's Signature Takeshi Nagao Date February 7, 2000

Residence Address Kawaguchi-shi, Saitama-ken, Japan

Citizenship Japanese

Post Office Address 4-7-21-504, Hon-cho, Kawaguchi-shi, Saitama-ken 332-0012 Japan

Full name of third joint inventor (if any): Yoshiyasu Takeuchi

Inventor's Signature Yoshiyasu Takeuchi Date February 7, 2000

Residence Address Tokyo, Japan

Citizenship Japanese

Post Office Address 2-20-5-724, Higashi Rokugo, Oota-ku, Tokyo 144-0046 Japan

Full name of fourth joint inventor (if any): Kenichi Fujita

Inventor's Signature Kenichi Fujita Date February 7, 2000

Residence Address Kawasaki, Japan

Citizenship Japanese

Post Office Address 2-14-1-205, Ta-machi, Kawasaki-ku, Kawasaki 210-0000 Japan

Full name of fifth joint inventor (if any): _____

Inventor's Signature _____ Date _____

Residence Address _____

Citizenship _____

Post Office Address _____

Full name of sixth joint inventor (if any): _____

Inventor's Signature _____ Date _____

Residence Address _____

Citizenship _____

Post Office Address _____

Full name of seventh joint inventor (if any): _____

Inventor's Signature _____ Date _____

Residence Address _____

Citizenship _____

Post Office Address _____

Full name of eighth joint inventor (if any): _____

Inventor's Signature _____ Date _____

Residence Address _____

Citizenship _____

Post Office Address _____